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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,654	07/07/2005	Joachim Kupe	DP-309749	3500
7590 Delphi Technologies Legal Staff PO Box 5052 Mail Code: 480-410-202 Troy, MI 48007-5052			EXAMINER NGUYEN, TU MINH	
			ART UNIT 3748	PAPER NUMBER
			MAIL DATE 06/11/2010	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/541,654

**Applicant(s)**

KUPE ET AL.

**Examiner**

TU M. NGUYEN

**Art Unit**

3748

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 March 0310.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3-34 and 36-48 is/are pending in the application.
- 4a) Of the above claim(s) 27 and 41-48 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-26,28-34 and 36-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 July 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. An Applicant's Amendment filed on March 3, 2010 has been entered. Claims 2 and 35 have been canceled; claims 1, 3-12, 14-25, 28, 29, 34, 36, 37, and 40 have been amended.

Overall, claims 1, 3-34, and 36-48 are pending in this application.

2. Based on a previous applicant's election with traverse of the species of Figure 6, claims 1, 3-26, 28-34, and 36-40 are readable thereon will be examined in its full merit. Claims 27 and 41-48 are withdrawn from further consideration by the examiner as being drawn to a non-elected invention.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1, 3-23, 34, and 36 are rejected under 35 U.S.C. 112, second paragraph, because the phrase "capable of" in claims 1, 7-12, 15, 19, and 34 renders the claims indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office Action:

A person shall be entitled to a patent unless --

(c) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. **Claims 24-26, 28-34, and 36-40 are rejected under 35 U.S.C. 102(e) as being anticipated by Duvinage et al. (PTC Publication WO 02/100519) (see U.S. Patent 7,254,939) for the English equivalence).**

Re claim 24, as shown in Figures 2 and 4, Duvinage et al. disclose a method of NOx abatement, comprising:

- storing engine NOx from an exhaust stream in a initial NOx adsorber (5) during a storage phase;
- forming reformat comprising primarily hydrogen and carbon monoxide in an off-line reformer (14) during a regeneration phase;
- reacting the reformat with the stored NOx to produce greater than or equal to about 5,000 ppm ammonia (a typical concentration of ammonia produced by a NOx adsorber during its regeneration phase) during the regeneration phase; and
- storing the ammonia in a selective catalytic reduction catalyst (4) during the regeneration phase.

Re claim 34, as shown in Figures 2 and 4, Duvinage et al. disclose a NOx abatement system, comprising:

- an in-line selective catalytic reduction catalyst (4) disposed in fluid communication with an engine (1), wherein the selective catalytic reduction catalyst is adapted for storing ammonia;
- an off-line reformer (14) in fluid communication with the selective catalytic reduction catalyst, wherein the reformer is adapted for producing a reformat comprising primarily hydrogen and carbon monoxide;
- an off-line reactor (17) in fluid communication with and downstream of the reformer, wherein the reactor comprises an ammonia forming catalyst; and
- an off-line burner (16) in fluid communication with and upstream of the reformer and the reactor.

Re claim 37, as shown in Figures 2 and 4, Duvinage et al. disclose a method of NOx abatement, comprising:

- burning (in NOx generator (16)) fuel off-line to form burner NOx;
- forming (in hydrogen generator unit (14)) a reformat comprising primarily hydrogen and carbon monoxide, off-line;
- reacting (in (17)) the burner NOx with the reformat to form ammonia, off-line;
- storing the ammonia in an in-line selective catalytic reduction catalyst (4);
- introducing engine NOx to the selective catalytic reduction catalyst; and
- reacting the engine NOx with the ammonia.

Re claims 25, 26, 28-33, 36, and 38-40, these claims do not contain any limitations and

features, which in combination with features and limitations of any claim to which they refer to, meet the requirements in respect of novelty and/or inventive step.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**8. Claims 1 and 3-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Duvinage et al. in view of Kupe et al. (U.S. Patent 6,832,473).**

Re claim 1, as shown in Figures 2 and 4, Duvinage et al. disclose a NOx abatement system, comprising:

- a first NOx adsorber (5) disposed in-line, being disposed downstream of and in fluid communication with an engine (12);
- a selective catalytic reduction catalyst (4) disposed in-line, downstream of and in direct fluid communication with the first NOx adsorber (5), wherein the selective catalytic reduction catalyst (4) is adapted for storing ammonia; and
- an off-line reformer (14) disposed in selective communication with and upstream of the first NOx adsorber (5) and the selective catalytic reduction catalyst (4), wherein the reformer (14) is adapted for producing a reformat (9) comprising primarily hydrogen and carbon monoxide.

Duvinage et al., however, fail to disclose that the system further comprises a first oxidation catalyst and a particulate filter disposed in-line, upstream of and in fluid communication with the first NO<sub>x</sub> adsorber, and the particulate filter includes a water gas shift catalyst.

As shown in Figure 2, Kupe et al. disclose a system for regenerating NO<sub>x</sub> adsorbers and particulate filters, comprising a NO<sub>x</sub> trap (32) and an off-line fuel reformer (16) to provide a reformat to the NO<sub>x</sub> trap. Kupe et al. teach that it is conventional in the art to include an oxidation catalyst (34) and a particulate filter (36) disposed in-line, upstream of and in fluid communication with the NO<sub>x</sub> trap, and the particulate filter includes a water gas shift catalyst (lines 34-43 of column 6). It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the oxidation catalyst and the particulate filter taught by Kupe et al. in the system of Duvinage et al., since the use thereof would have been routinely practiced by those with ordinary skill in the art to effectively remove harmful soot emissions in the exhaust gas stream.

Re claims 3-23, these claims do not contain any limitations and features, which in combination with features and limitations of any claim to which they refer to, meet the requirements in respect of novelty and/or inventive step.

***Response to Arguments***

9. Applicant's arguments with respect to the references applied in the previous Office Action have been fully considered but they are moot in view of the new ground(s) of rejection.

***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office Action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Prior Art***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure and consists of two patents: Mulligan (U.S. Patent 6,739,125) and Bonadies et al. (U.S. Patent 7,188,469) further disclose a state of the art.



*Communication*

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Tu Nguyen whose telephone number is (571) 272-4862.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Thomas E. Denion, can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TMN

June 7, 2010

/Tu M. Nguyen/

Tu M. Nguyen

Primary Examiner

Art Unit 3748